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EXAMINER

ATTORNEY

PAPER NUMBER

3407

11/96

DATE MAILED: 12/04/96

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☒ Responsive to communication filed on 7/1/96 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- ☒ Notice of References Cited by Examiner, PTO-892.
- ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
- ☐ Notice of Art Cited by Applicant, PTO-1449.
- ☐ Notice of Informal Patent Application, PTO-152.
- ☐ Information on How to Effect Drawing Changes, PTO-1474.
- ☐

Part II SUMMARY OF ACTION

1. ☒ Claims 1-2, 5-8, 11-12 & 17-24 are pending in the application.

Of the above, claims are withdrawn from consideration.

2. ☒ Claims 3-4, 9-10 and 13-16 have been cancelled.

3. ☐ Claims are allowed.

4. ☒ Claims 1-2, 5-8, 11-12 & 17-24 are rejected.

5. ☐ Claims are objected to.

6. ☐ Claims are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed has been ☐ approved; ☐ disapproved (see explanation).

12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. ; filed on

13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

EXAMINER'S ACTION

Art Unit: 3407

Claims 3-4, 9-10 and 13-16 have been cancelled.

Claims 1-2, 5-8, 11-12 and 17-24 are pending.

***Specification***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. 112, first paragraph, as failing to provide an adequate written description of the invention. Regarding claims 5 and 6, the specification fails to disclose a single embodiment having both thermally conductive fibers and an aluminum porous medium as claimed in claims 5 and 6. Regarding claims 7, 8, 11 and 12, the specification fails to disclose the porous material being substantially homogeneously disposed within the cavity.

***Claim Rejections - 35 USC § 112***

Claims 5, 6, 11, 12, 23 and 24 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claims 5 and 6, the recitation "said porous medium" lacks antecedence. The remaining claims are included due to dependency.

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Claims 5-8, 11, 12, 23 and 24 are further rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the objection to the specification. The remaining claims are included due to dependency.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

Claims 1, 5, 7, 11, 17 and 19 are rejected under 35 U.S.C. § 103 as being unpatentable over Lebailly et al. in view of Kuzay and Scanlon et al.

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The patent of Lebailly et al., in Figures 1-3 and in column 2, line 35 through column 4, line 5, discloses a phase change liquid and an aluminum ~~or graphite~~ fibrous porous material (5) homogeneously disposed within the liquid and filled/located within an enclosed cavity formed by thermally conductive metal plates/surfaces (1,2). The patent of Lebailly et al. fails to disclose the thermally conductive surface being made from thermally conductive fibers disposed in a matrix material and the porous material being integral with and extending from the thermally conductive surface.

The patent of Kuzay, in Figures 1-3 and 5 and in column 2, lines 40-58, discloses a fibrous, porous material (12) bonded to a thermally conductive surface (11,24) and homogeneously disposed within a cavity for the purpose of constantly channelling heat from the conductive surface to a phase change fluid. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Lebailly et al. a fibrous, porous material bonded to the thermally conductive surface for the purpose of constantly channelling heat from the conductive surface to the phase change fluid as disclosed in Kuzay. Regarding claims 7 and 11, the porous material is considered to be homogeneously disposed within the cavity as illustrated in Figure 5 of Lebailly et al. and as illustrated in Figures 1-2 of Kuzay.

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The patent of Scanlon et al., in Figures 1-4 and in column 3, lines 20-65, discloses a heat exchanger comprised of carbon/carbon composite/matrix (graphite fibers held together by a bonding matrix such as an epoxy resin material) heat exchanger plates (30) for the purpose of transferring heat across each plate. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Lebailly et al. as modified, the thermally conductive surface being a epoxy resin and graphite fiber matrix plate such for the purpose of transferring heat across the plate as disclosed in Scanlon et al. The remaining limitations are considered to be clearly met.

Claims 2, 6, 8, 12, 18 and 20-24 are rejected under 35 U.S.C. § 103 as being unpatentable over Lebailly et al. in view of Kuzay and Scanlon et al. as applied to claims 1, 5, 7, 11, 17 and 19 above, and further in view of Hermanns et al. The patent of Lebailly et al. as modified, discloses all the claimed features of the invention with the exception of the phase change material being a wax.

The patent of Hermanns et al., in Figures 1a-3b, in column 1, lines 27-29, in column 3, lines 25-29 and in column 4, lines 22-31, discloses a solid to liquid phase change material, such as a paraffin wax (1,1b), filled within an enclosed cavity for the purpose of uniformly transferring heat. It would have

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been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Lebailly et al. as modified, the phase change material being a wax for the purpose of uniformly transferring heat as disclosed in Hermanns et al. Regarding claims 8 and 12, the porous material is considered to be homogeneously disposed in the cavity as illustrated in Figure 5 of Lebailly et al. and as illustrated in Figures 1-2 of Kuzay.


**Conclusion**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Atkinson whose telephone number is (703) 308-2603 (FAX (703) 308-7765).

C.A.  
C.A.

November 25, 1996

  
**JOHN RIVELL**  
**PRIMARY EXAMINER**  
**ART UNIT 347**